Test Report

Electromagnetic Compatibility

DAT- P-121 / 02-00

Test report file no:	**E-0012-1453-01 MG**
Applicant:	**VESTEL ELEKTRONIK SANAYI VE TICARET A.S.** **Organze Sanayi Bölgesi** **45030 MANISA**
Contact person:	**Hülya Döner**
Model:	**Vestel Promega PC**
Kind of Product:	**PC**
Manufacturer:	**VESTEL Komunikasyon A.S.** **Ege Serbest Bolgesi** **Akcay Cad. Ayfer Sk. No: 144/1** **35410 Gaziemir** **Izmir, Turkey**
Test result Emission tests:	**The tested sample meets the requirements stated on page 6 according to FCC Part 15 Subpart B**
Date of issue:	**2004-November-18**

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DIRECTORY

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IDENTIFICATION OF THE TEST LABORATORY

Company name:	*emitel* AG
Address:	Landshuter Str. 211a D-94315 Straubing Germany
Contact person:	Dieter Fröhlich
Contact address:	Phone: +49 9421 9746-0 Fax.: +49 9421 9746-70 eMail: germany@emitel.de Homepage: www.emitel.de
FCC Registration number:	765810

DESCRIPTION OF THE EQUIPMENT UNDER TEST (EUT):

Date of receipt of test sample:	2004-November-02
Testing Start Date:	2004-November-05
Testing End Date:	2004-November-09

Number of received/tested samples:	1
Serial Number:	7160803000005
FCC-ID:	SOQ-VESTELPROMEGA
Voltage consumption:	120V/60 Hz
Product status:	☐ Development Sample ☒ Preproduction Sample ☐ Production Sample
Dimensions:	**L x W x H: 49cm x 20cm x 43,5cm**

Following system devices are parts of the EUT and were connected during the measurement:

Mouse:	Genius Power Scroll Eye PS/2 Optical	S/N 23002682751401
Keyboard:	Samsung SDM 4510P	S/N 43000822

Following cables were connected during the measurement:

Power supply cord:	2m, unshielded
LPT I cable:	3m, shielded
RS 232 cable:	2m, shielded
Headphone:	1,5m, unshielded
Network	3m, unshielded
USB cable	3m, shielded
FIR cable	2m shielded (port internal not connected to mainboard)

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OPERATION MODES

OPERATION MODES:

Windows Desktop on screen – Mediaplayer is working for sound.

EUT MONITORING

Monitor	17” ADI Miroscan	S/N 167030

ENVIRONMENTAL CONDITIONS

Temperature	20 °C
Humidity	50 %
Atmosperheric pressure:	860-1060 mbar

STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report according to NIS 81 /5.1994 „The Treatment of Uncertainty in EMC Measurements“ and is documented in the emitel quality system according to EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

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TEST SPECIFICATION

The tests were performed according to the following specifications:

☒	FCC Part 15 Subpart A	Code of Regulations Part 15 (Radio Frequency Devices), Subpart A (General) of the Federal Communication Commission (FCC)	December, 2003
☒	FCC Part 15 Subpart B	Code of Regulations Part 15 (Radio Frequency Devices), Subpart B (Unintentional Radiators) of the Federal Communication Commission (FCC)	December, 2003
☒	ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz - 40 GHz	2001

FCC Part 15 Subpart B

Specification	Result	Remarks
§15.107 Conducted emission	limit kept	
§15.109 Radiated emission	limit kept	

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SUMMARY:

FINAL JUDGEMENT

The tested sample meets the requirements according to the technical regulations stated on page 6 of

Code of Regulations Part 15 Subpart B (intentional radiators)
of the Federal Communication Commission (FCC)

Straubing, 2004-November-18

emitel AG

Dieter Fröhlich
Dipl. Ing. (FH)
Director

Test engineer:

Martin Greil

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Emission test

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Conducted emission

(150 kHz - 30 MHz)

TEST CONDITIONS AND RESULTS:

Conducted emissions were measured in the frequency range 0.15 MHz to 30 MHz. The bandwidth of the EMI-Receiver was set to 10 kHz and the detector-function was set to CISPR quasi-peak.
The test setup was made in accordance with ANSI C63.4-2001.
Measurements were performed on phase and neutral lines of the power-cords of the tested system. Preliminary scans were taken with the detector-function of the EMI-receiver set to peak to determine the conducted EMI-profile of the EUT. At the final test the cables and equipment were placed and moved within the range of positions likely to find their maximum emissions.
The measurements were performed in a shielded room.

☐ Test not applicable

Testlocation: ☒ Shielded room 1
☐ Shielded room 2
☐ Shielded room 3
☐ Shielded room 4

Used test instruments and test accessories:

Test instrument	**Type**	**Manufacturer**	**ID - No.**
Test receiver	ESH 3	Rohde & Schwarz	01-01/01-01-065
LISN	ESH2-Z5	Rohde & Schwarz	01-01/01-01-041
LISN	NSLK 8128	Schwarzbeck	01-01/01-01-056
HF-cable	RG 223	Emitel	01-05/02-01-046
HF-cable	RG 214	Emitel	01-05/02-01-038

TEST RESULTS:

The requirements are: ☒ MET ☐ NOT MET

Remarks: _____

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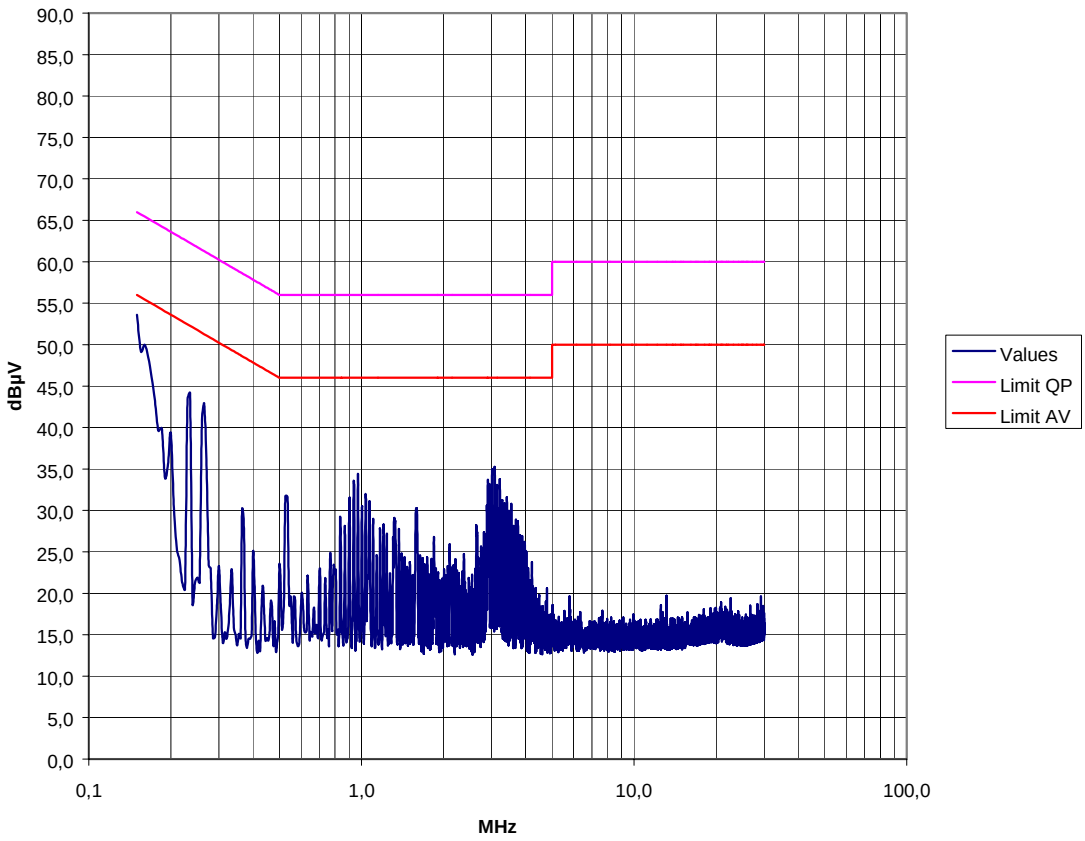
TEST CONDUCTED EMISSIONS:

Project file:	E-0012-1453-01	**Mode:**	
Applicant:	Vestel	PC Mode, Windows Desktop	
Model:	PC Vestel Promega 10031026	(1024x768)	
Date of test:	05.11.2004		
Operator:	Martin Greil		

Detector: PEAK
Result: ~~**SCAN**~~

FCC Part 15 Subpart B **Limit Class B** **Phase L1**



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TEST CONDUCTED EMISSIONS (TABLE):

Project file:	E-0012-1453-01	**Mode:**	
Applicant:	Vestel	PC Mode, Windows Desktop	
Model:	PC Vestel Promega 10031026	(1024x768)	
Date of test:	05.11.2004		
Operator:	Martin Greil		

Detector: QP / AV
Result: Limit kept

Part 15 Subpart B **Limit Class B** **Phase L1**

Frequency [MHz]	Value QP [dBµV]	Limit QP [dBµV]	Value AV [dBµV]	Limit AV [dBµV]	Limit exceeded [dB]
0,150	49,5	66,0	12,7	56,0	
0,235	45,0	62,3	43,9	52,3	
0,265	43,3	61,3	41,3	51,3	

Remarks: Peak values are lower than Quasi peak and Average limit.
Frequencies which are not listed have a margin more than 6dB to the limit.

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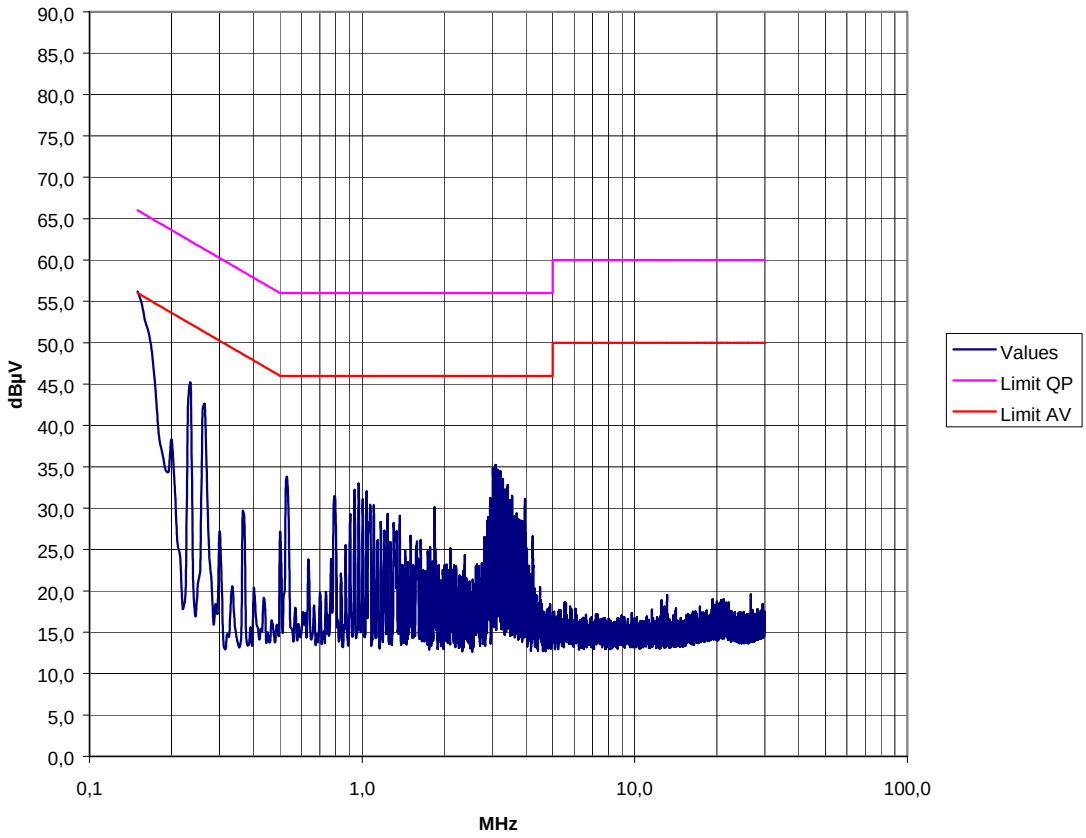
TEST CONDUCTED EMISSIONS:

Project file:	E-0012-1453-01	**Mode:**	
Applicant:	Vestel	PC Mode, Windows Desktop	
Model:	PC Vestel Promega 10031026	(1024x768)	
Date of test:	05.11.2004		
Operator:	Martin Greil		

Detector: PEAK
Result: ~~**SCAN**~~

FCC Part 15 Subpart B **Limit Class B** **Phase N**



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TEST CONDUCTED EMISSIONS (TABLE):

Project file:	E-0012-1453-01	**Mode:**	
Applicant:	Vestel	PC Mode, Windows Desktop	
Model:	PC Vestel Promega 10031026	(1024x768)	
Date of test:	05.11.2004		
Operator:	Martin Greil		

Detector: QP / AV
Result: Limit kept

FCC Part 15 Subpart B **Limit Class B** **Phase N**

Frequency [MHz]	Value QP [dBµV]	Limit QP [dBµV]	Value AV [dBµV]	Limit AV [dBµV]	Limit exceeded [dB]
0,155	48,6	65,7	12,5	55,7	
0,235	44,4	62,3	42,7	52,3	
0,265	43,1	61,3	41,6	51,3	

Remarks: Peak values are lower than Quasi peak and Average limit.
Frequencies which are not listed have a margin more than 6dB to the limit.

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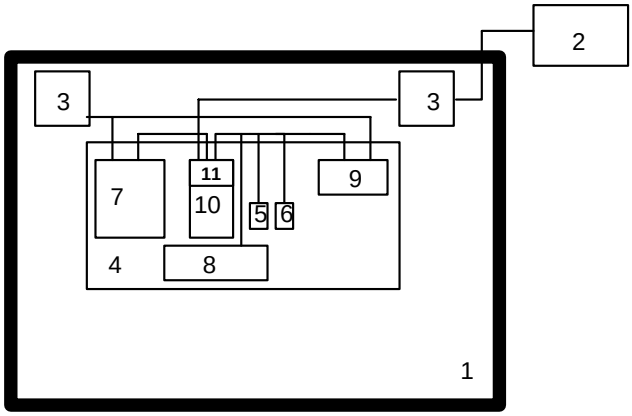
MEASUREMENT SETUP CONDUCTED EMISSIONS



1 Shielded room
2 Test receiver
3 LISN
4 Wooden table
5 Optical PS/2 Mouse
6 Serial Peripheral (mouse)
7 Monitor
8 PS2 Peripheral (keyboard)
9 Parallel Peripheral (printer)
10 EUT
11 Headphone

PHOTO TESTSETUP CONDUCTED EMISSIONS

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Radiated emission

(25 MHz – 1000 MHz)

TEST CONDITIONS AND RESULTS:

Radiated emissions are measured over the frequency range from 25 MHz to 1 GHz. The bandwidth of the EMI-receiver is set to 120 kHz and the detector-function is set to CISPR quasi-peak.
The test setup is made in accordance with ANSI C63.4-2001. Measurements are made in both the horizontal and vertical planes of polarization. Preliminary scans are taken in a full-anechoic room using a spectrum analyzer with the detector function set to peak. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.
All tests are performed at a test-distance of 3 meters. For final testing an open-area test-site is used. During the tests the EUT is rotated all around and the receiving-antenna is raised and lowered from 1 meter to 4 meters to find the maximum levels of emissions. The cables and equipment is placed and moved within the range of position likely to find their maximum emissions.

☐ Test not applicable

Test location: ☒ Shielded room 2, Pretest
☒ Open site, Final test

Antenna EuT distance: ☒ 3 m, Pretest
☒ 3 m, Final test

Used test instruments and test accessories:

Test instrument	**Type**	**Manufacturer**	**ID - No.**
Pretest:			
Spectrum Analyser	FSP 30	Rohde & Schwarz	01-01/01-01-063
Antenna	3142 B	EMCO	01-01/01-01-067
HF-Cable	RG 213	Suhner	01-05/02-01-043
HF-Cable	RG 213	Emitel	01-05/02-01-038
Preamplifier	TVV 695	MTS	01-05/02-01-016
Final test:			
Receiver	ESVP	Rohde & Schwarz	01-01/01-01-035
Antenna	VULB 9163	Schwarzbeck	01-01/01-01-059
HF-Cable	RG 217	Suhner	01-05/02-01-048
HF-Cable	RG 214	Emitel	01-05/02-01-050

TEST RESULTS:

The requirements are: ☒ MET ☐ NOT MET

Remarks: _____

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RADIATED EMISSIONS:

Horizontal Antenna Polarization

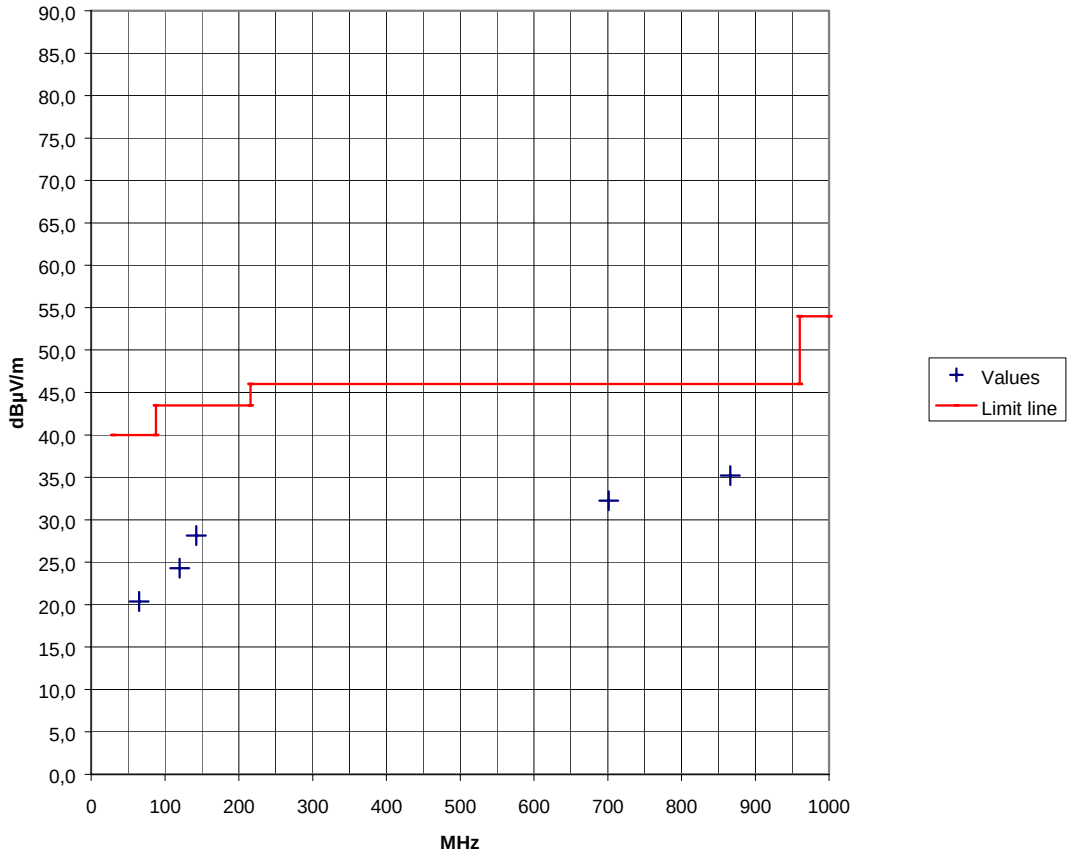
Test distance: 3 m

Project file: E-0012-1453-01
Applicant: Vestel
Model: Promega PC
Date of test: 05.11.2004
Operator: Martin Greil

Mode:
PC Mode, Windows Desktop (1024x768)

Detector: QuasiPeak
Result: Limit kept

FCC Part 15 **Subpart B, Limit QP** **Horizontal Polarization**



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FINAL TEST RADIATED EMISSION (TABLE):

Horizontal Antenna Polarization Test distance: 3 m

Project file: E-0012-1453-01
Applicant: Vestel
Model: Promega PC
Date of test: 05.11.2004
Operator: Martin Greil

Mode:
PC Mode, Windows Desktop
(1024x768)

Detector: QuasiPeak
Result: Limit kept

FCC Part 15 **Subpart B, Limit QP** **Horizontal Polarization**

Frequency [MHz]	Reading [dBµV]	Correction [dB]	Value [dBµV/m]	Limit [dBµV/m]	Limit exceeded [dB]
64,9	7,9	12,5	20,4	40,0	
119,9	12,2	12,1	24,3	43,5	
142,5	17,9	10,3	28,2	43,5	
701,4	7,2	25,0	32,2	46,0	
866,1	7,5	27,7	35,2	46,0	

Remarks: Field strength value (dBµV/m) = Reading (dBµV) + Correction (dB)
Frequencies which are not listed have a margin more than 6dB to the limit.

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RADIATED EMISSIONS:

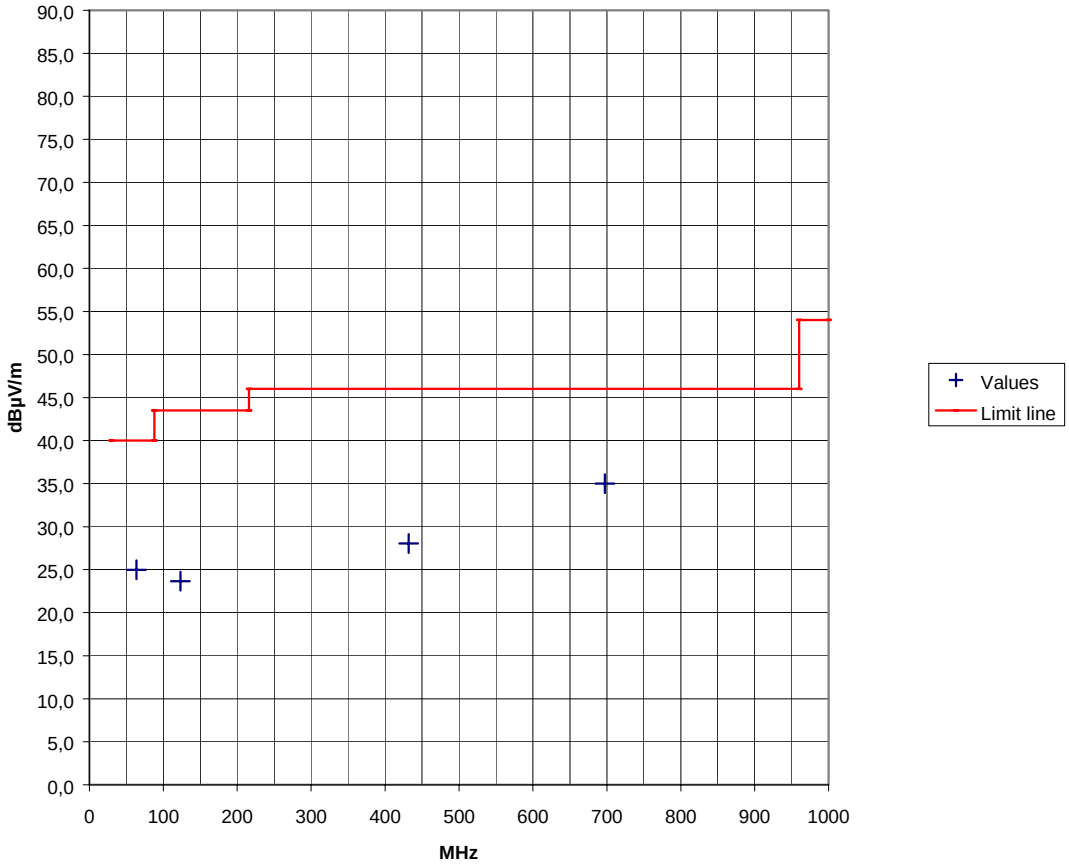
Vertical Antenna Polarization Test distance: 3 m

Project file:	E-0012-1453-01
Applicant:	Vestel
Model:	Promega PC
Date of test:	05.11.2004
Operator:	Martin Greil

Mode:
PC Mode, Windows Desktop (1024x768)

Detector:	QuasiPeak
Result:	Limit kept

FCC Part 15 **Subpart B, Limit QP** **Vertical Polarization**



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FINAL TEST RADIATED EMISSIONS (TABLE):

Vertical Antenna Polarization Test distance: 3 m

Project file: E-0012-1453-01
Applicant: Vestel
Model: Promega PC
Date of test: 05.11.2004
Operator: Martin Greil

Mode:
PC Mode, Windows Desktop
(1024x768)

Detector: QuasiPeak
Result: Limit kept

FCC Part 15 **Subpart B, Limit QP** **Vertical Polarization**

Frequency [MHz]	Reading [dBµV]	Correction [dB]	Value [dBµV/m]	Limit [dBµV/m]	Limit exceeded [dB]
63,5	12,5	12,5	25,0	40,0	
123,1	11,7	12,0	23,7	43,5	
432,1	7,6	20,4	28,0	46,0	
697,4	10,0	25,0	35,0	46,0	

Remarks: Field strength value (dBµV/m) = Reading (dBµV) + Correction (dB)
Frequencies which are not listed have a margin more than 6dB to the limit.

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Radiated emission

(1 GHz – 20 GHz)

TEST CONDITIONS AND RESULTS:

Radiated emissions are measured over the frequency range from 1 GHz to 20 GHz. The bandwidth of the spectrum analyser is set to 1 MHz and the detector-function is set to average.
The test setup is made in accordance with ANSI C63.4-2001. Measurements are made in both the horizontal and vertical planes of polarization. Preliminary scans are taken in a full-anechoic room using a spectrum analyzer with the detector function set to peak. This preliminary scans were performed at the lowest, middle and highest channel to find the worst case. Final measurement was performed with in this worst case. Hand-held or body-worn devices are rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission relative to the limit and therefore shall be used for final testing.
All tests are performed at a test-distance of 3 meters. For final testing an open-area test-site is used. During the tests the EUT is rotated all around and the receiving-antenna is raised and lowered from 1 meter to 4 meters to find the maximum levels of emissions. The cables and equipment is placed and moved within the range of position likely to find their maximum emissions.

☐ Test not applicable

Test location: ☒ Shielded room 2, Pretest
☒ Open site, Final test

Antenna EuT distance: ☒ 3 m, Pretest
☒ 3 m, Final test

Used test instruments and test accessories:

Test instrument	**Type**	**Manufacturer**	**ID - No.**
Spectrum Analyser	FSP 30	Rohde & Schwarz	01-01/01-01-063
Preamplifier	AMF-40-005-180-24-10P	MITEQ Inc.	01-02/01-02-005
Antenna Horn 1-18GHz	3115	ETS EMC Systems LP	01-01/01-01-062
Antenna Horn 18-26,5GHz	3160-09	ETS EMC Systems LP	01-05/02-01-002
HF-cable	FA210A0050M	Anritsu GmbH	01-05/02-01-034

TEST RESULTS:

The requirements are: ☒ MET ☐ NOT MET

Remarks: _____

FINAL TEST RADIATED EMISSIONS:

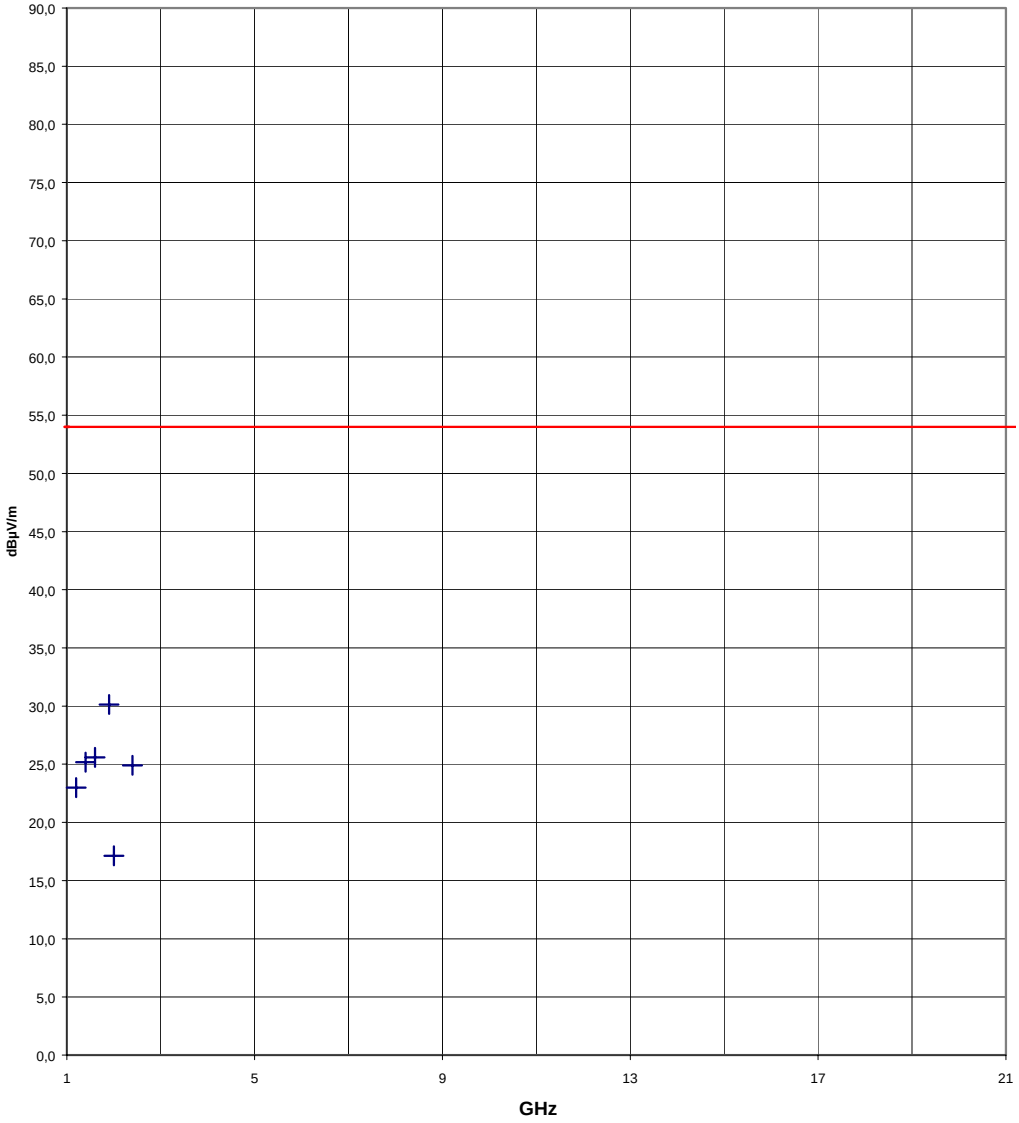
Horizontal Antenna Polarization

Test distance: 3 m

Project file: E-0012-1453-01
Applicant: Vestel
Model: Promega PC
Date of test: 08.11.2004
Operator: Martin Greil
Detector: AV
Result: Limit kept

Mode:
PC Mode, Windows Desktop (1024x768)

FCC Part 15 Subpart B, Limit AV **Horizontal Polarization**



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FINAL TEST RADIATED EMISSION (TABLE):

Horizontal Antenna Polarization Test distance: 3 m

Project file:	E-0012-1453-01	**Mode:**	
Applicant:	Vestel	PC Mode, Windows Desktop	
Model:	Promega PC	(1024x768)	
Date of test:	08.11.2004		
Operator:	Martin Greil		
Detector:	AV		
Result:	Limit kept		

FCC Part 15 Subpart B, Limit AV Horizontal Polarization

Frequency [GHz]	Reading [dBµV]	Correction [dB]	Value [dBµV/m]	Limit [dBµV/m]	Limit exceeded [dB]
1,20	33,0	-10,0	23,0	54,0	
1,40	34,0	-8,8	25,2	54,0	
1,60	33,2	-7,6	25,6	54,0	
1,90	35,7	-5,6	30,1	54,0	
2,00	22,0	-4,9	17,1	54,0	
2,40	29,2	-4,3	24,9	54,0	

Remarks: Frequencies which are not listed have a margin more than 6dB to the limit.

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FINAL TEST RADIATED EMISSION:

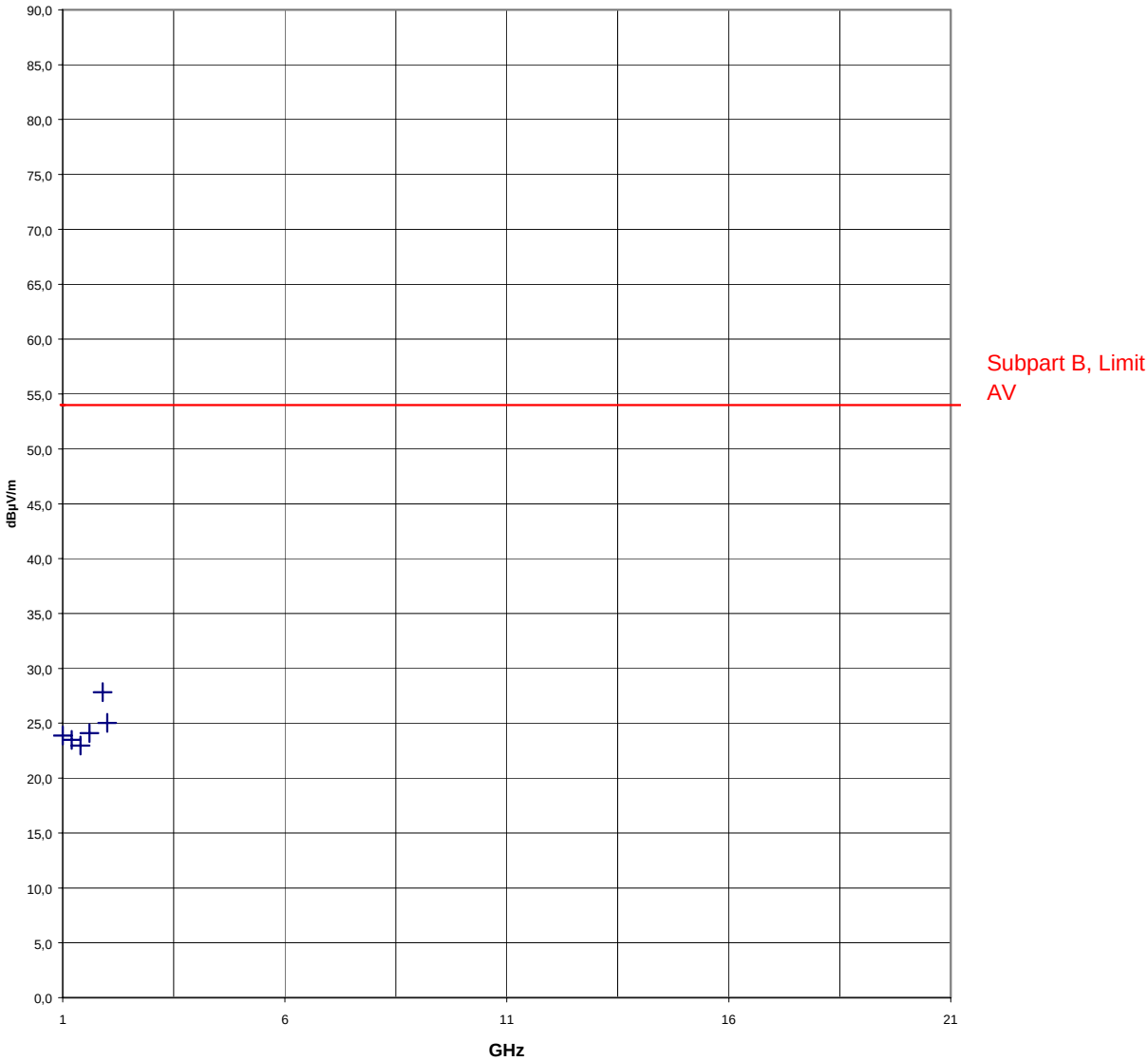
Vertical Antenna Polarization

Test distance: 3 m

Project file: E-0012-1453-01
Applicant: Vestel
Model: Promega PC
Date of test: 08.11.2004
Operator: Martin Greil
Detector: AV
Result: Limit kept

Mode:
PC Mode, Windows Desktop (1024x768)

FCC Part 15 Subpart B, Limit AV **Vertical Polarization**



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FINAL TEST RADIATED EMISSIONS (TABLE):

Vertical Antenna Polarization Test distance: 3 m

Project file:	E-0012-1453-01	**Mode:**	
Applicant:	Vestel	PC Mode, Windows Desktop	
Model:	Promega PC	(1024x768)	
Date of test:	08.11.2004		
Operator:	Martin Greil		
Detector:	AV		
Result:	Limit kept		

FCC Part 15 Subpart B, Limit AV **Vertical Polarization**

Frequency [GHz]	Reading [dBµV]	Correction [dB]	Value [dBµV/m]	Limit [dBµV/m]	Limit exceeded [dB]
1,00	34,8	-10,9	23,9	54,0	
1,20	33,5	-10,0	23,5	54,0	
1,40	31,8	-8,8	23,0	54,0	
1,60	31,7	-7,6	24,1	54,0	
1,90	33,4	-5,6	27,8	54,0	
2,00	29,9	-4,9	25,0	54,0	

Remarks: Frequencies which are not listed have a margin more than 6dB to the limit.

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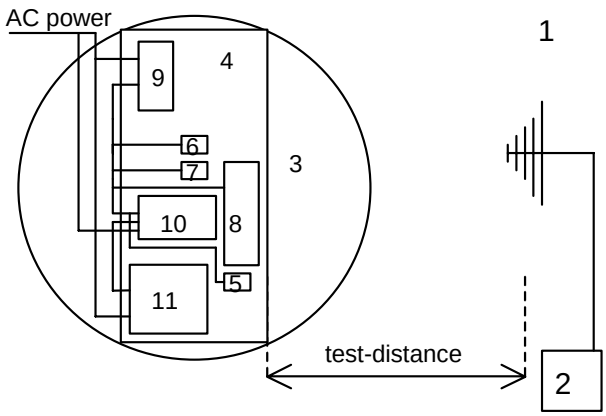
MEASUREMENT SETUP RADIATED EMISSIONS



1 Open area test site
2 Test receiver
3 Turntable
4 Wooden table
5 PS2 Optical Mouse
6 Headphone
7 Serial Peripheral(mouse)
8 PS2 Peripheral (keyboard)
9 Parallel Peripheral (printer)
10 EUT
11 Monitor

PHOTO TESTSETUP RADIATED EMISSION

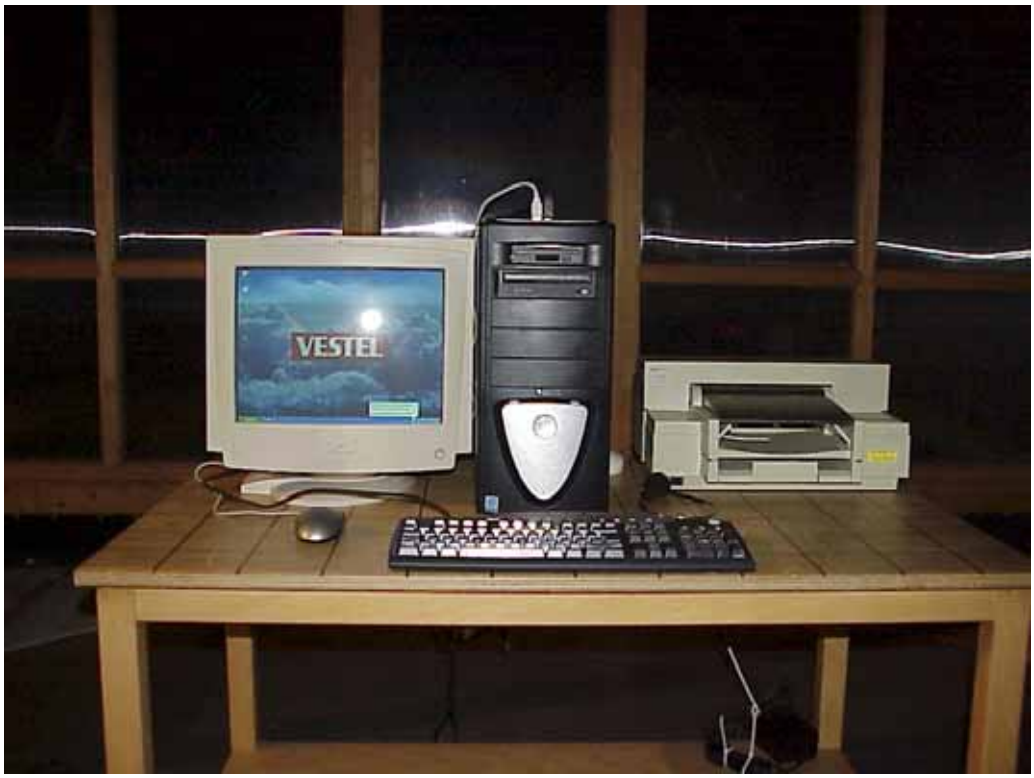


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PHOTO OF THE TESTSAMPLE

FRONT VIEW

REAR VIEW

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SIDE VIEW

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OPEN COVER VIEW

KEYBOARD TOP VIEW

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KEYBOARD BOTTOM VIEW

MOUSE TOP VIEW

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MOUSE BOTTOM VIEW

HARD DISK TOP VIEW

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HARD DISK BOTTOM VIEW

CD-ROM FRONT VIEW

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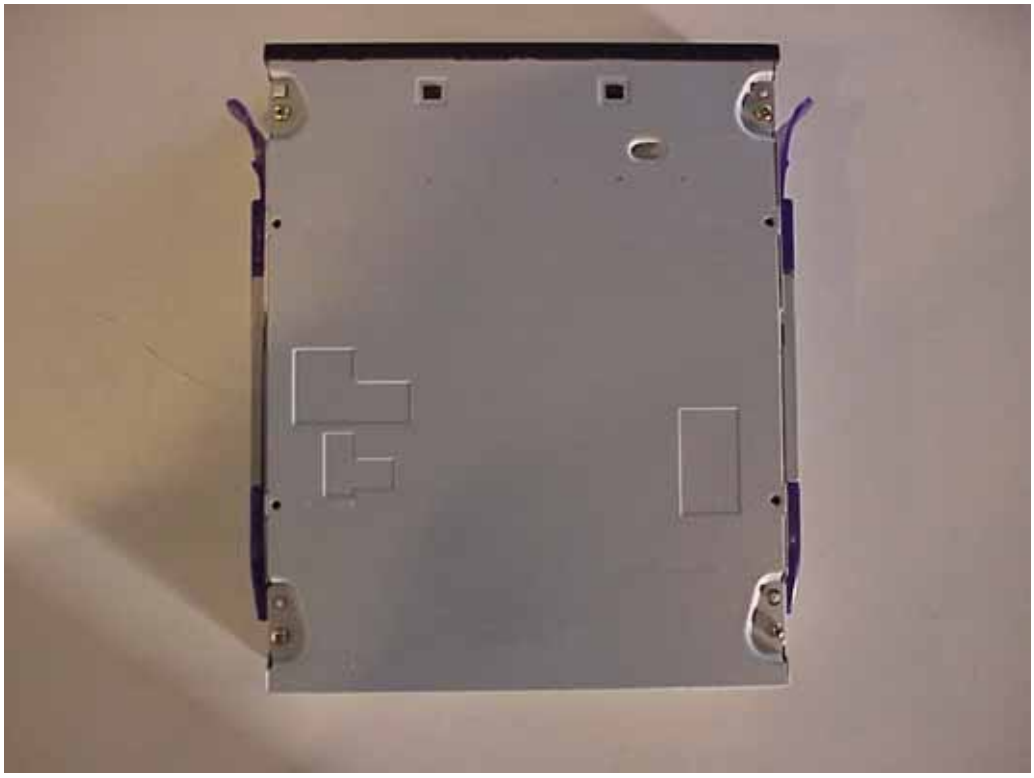
CD-ROM TOP VIEW

CD-ROM BOTTOM VIEW



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CD-ROM REAR VIEW

FDD-FRONT VIEW

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FDD-TOP VIEW

FDD-BOTTOM VIEW

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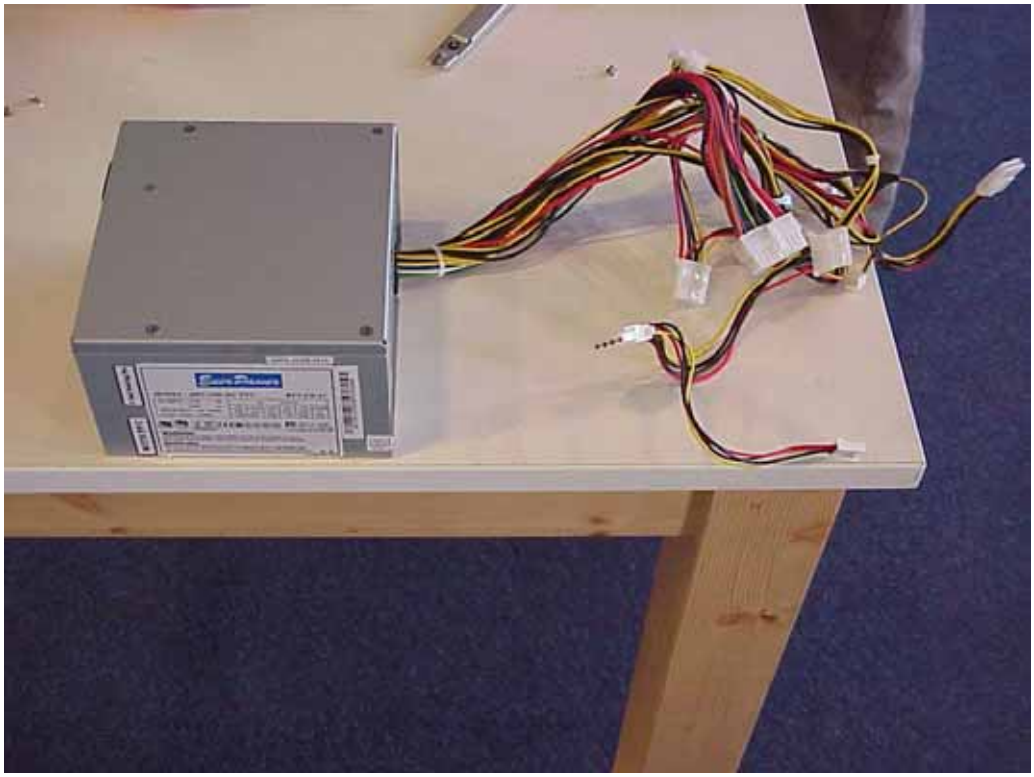
POWER SUPPLY SIDE VIEW

POWER SUPPLY TOP VIEW



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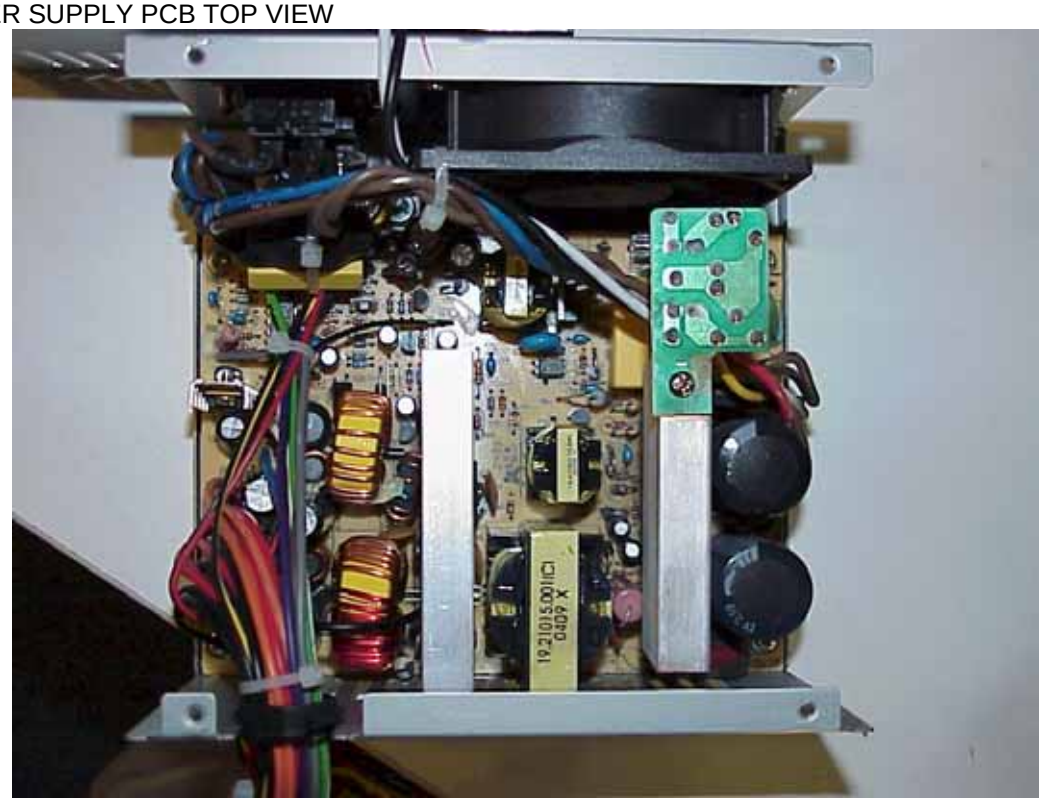
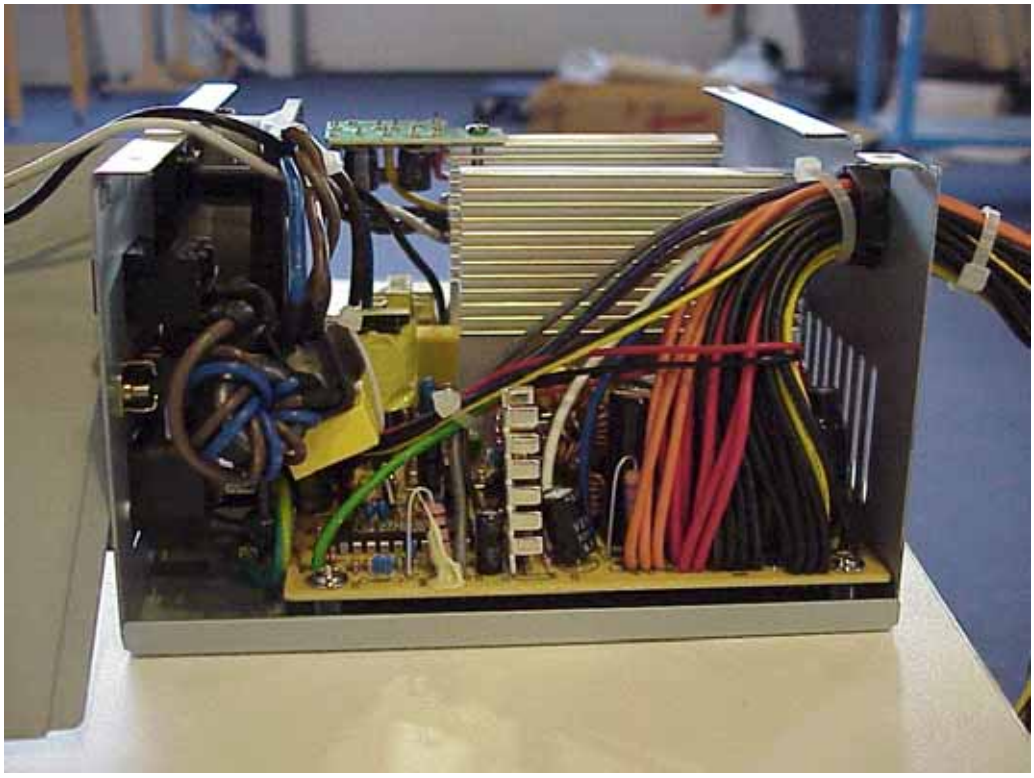
POWER SUPPLY PCB TOP VIEW



POWER SUPPLY PCB SIDE VIEW



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CHASSIS FAN TOP VIEW

MAINBOARD BOTTOM VIEW

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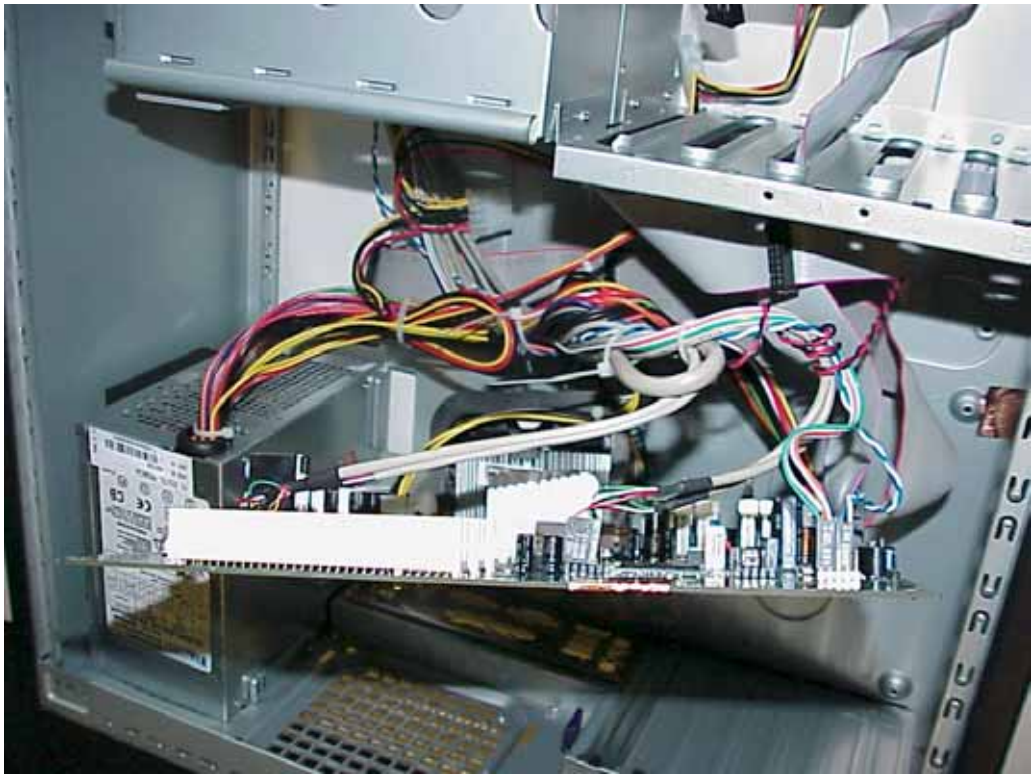
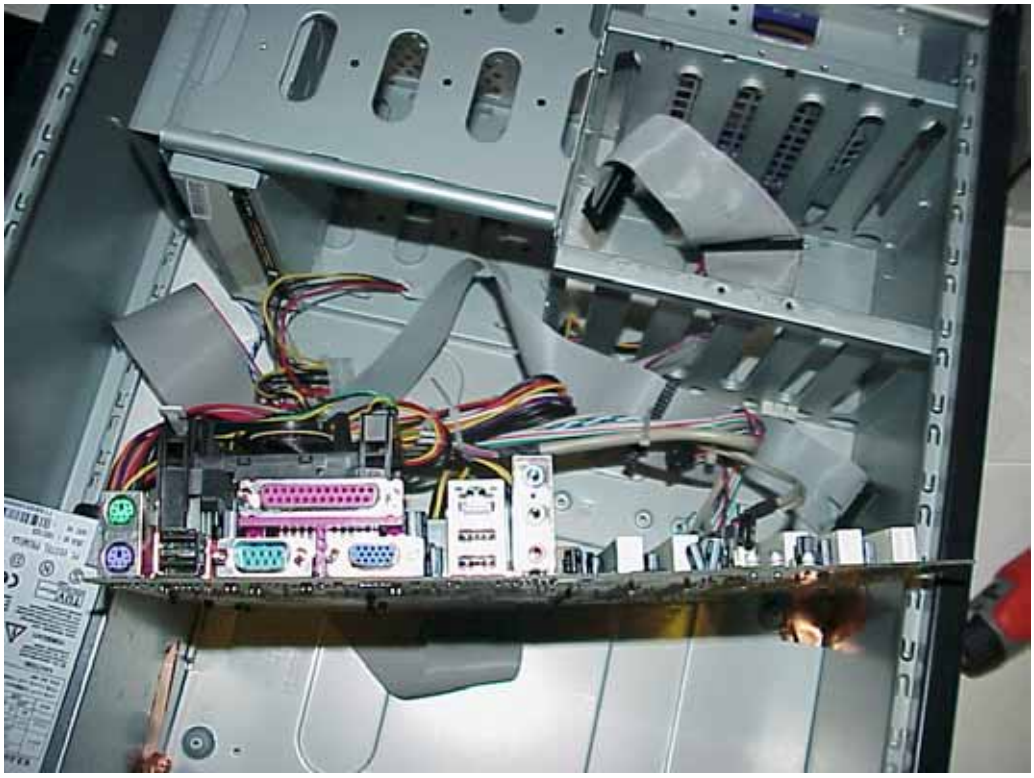
MAINBOARD SIDE VIEW



MAINBOARD REAR VIEW



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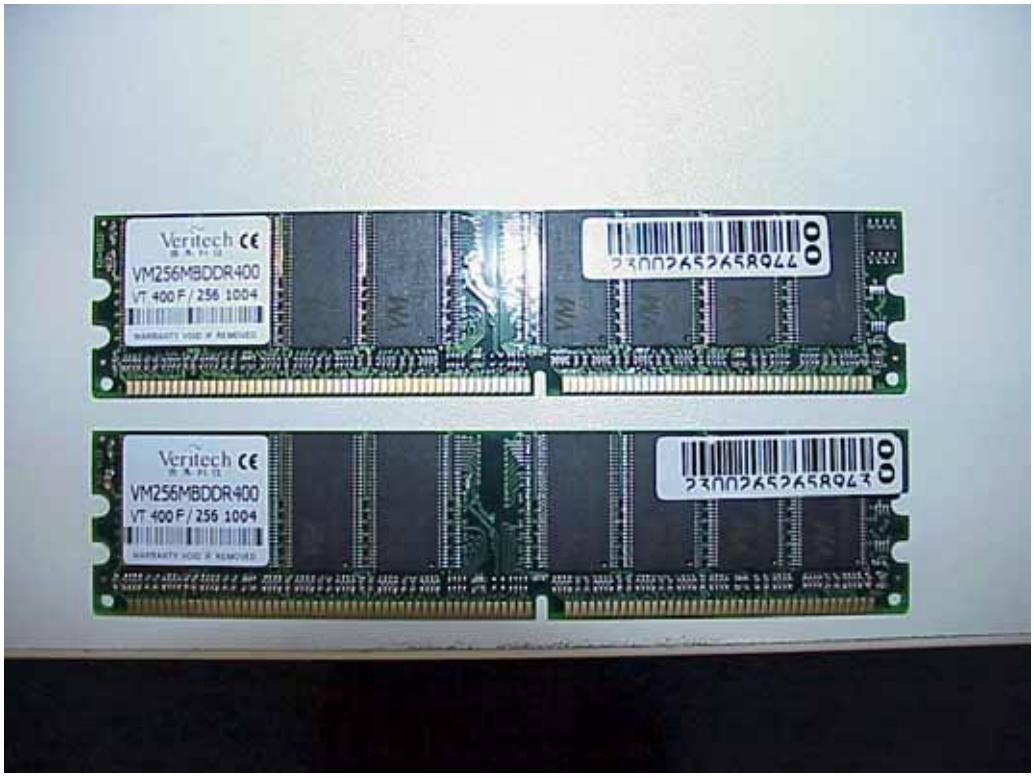
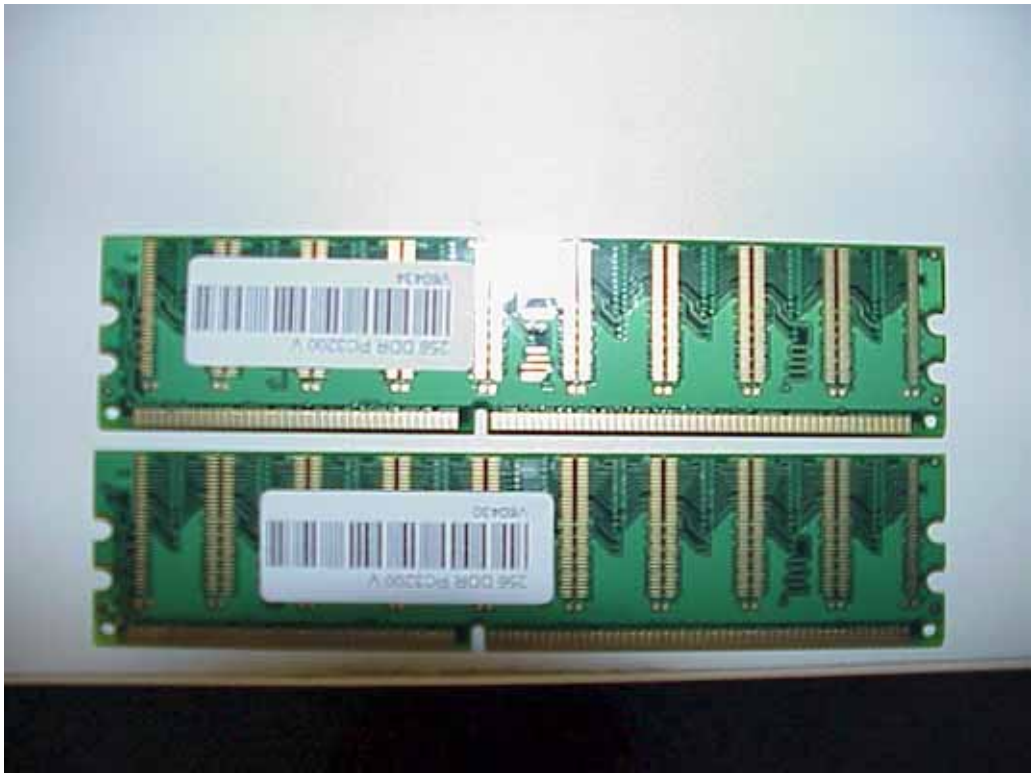
MEMORY FRONT VIEW



MEMORY REAR VIEW



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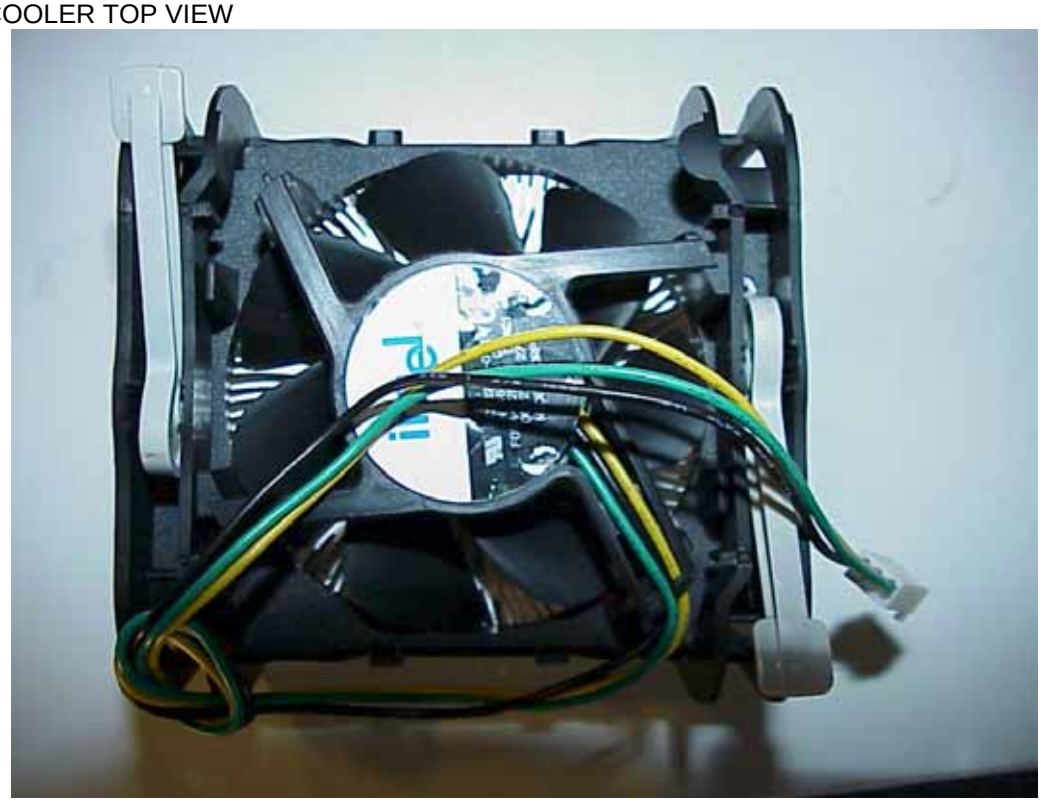
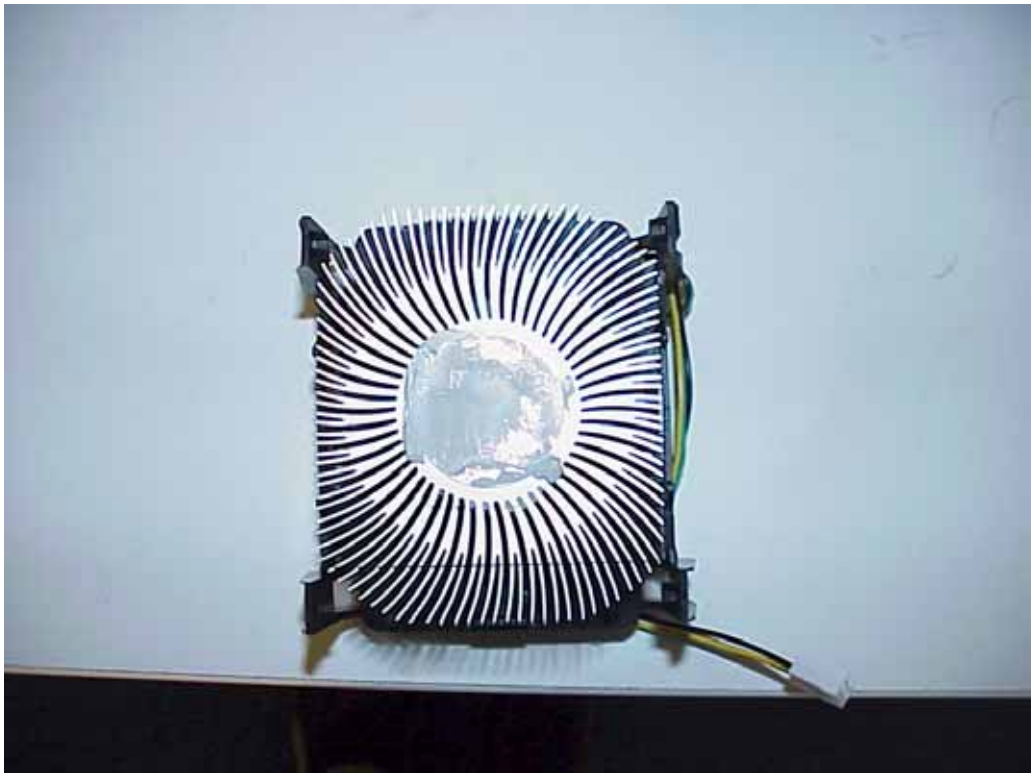
CPU COOLER TOP VIEW



CPU COOLER BOTTOM VIEW



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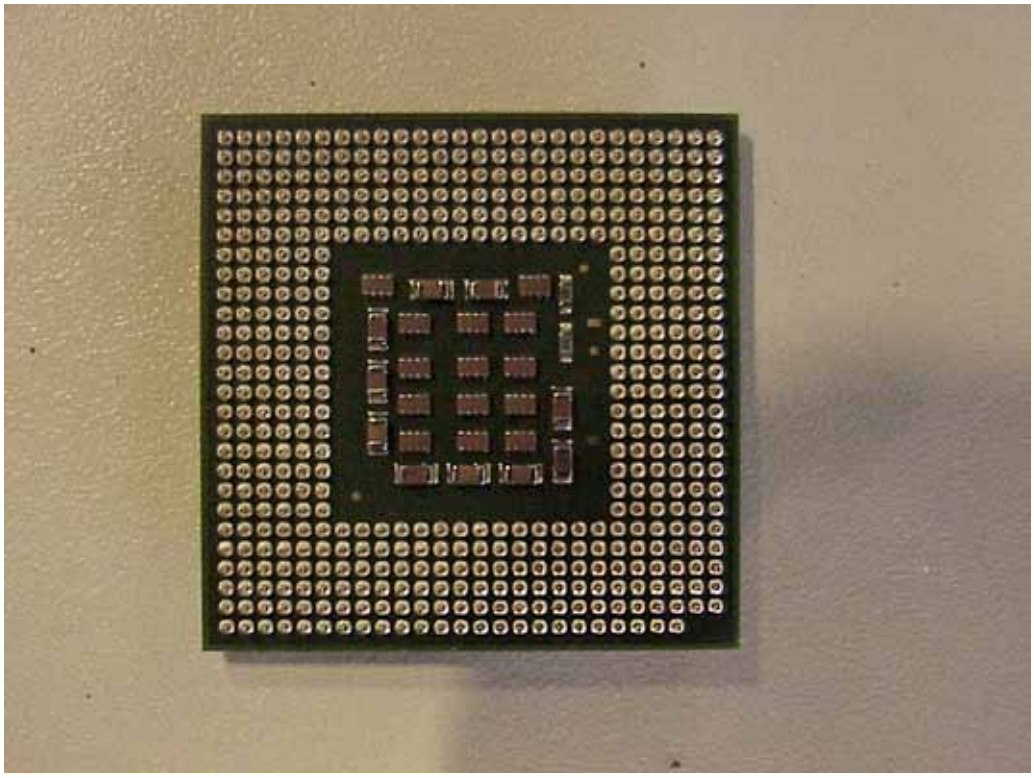
CPU TOP VIEW

CPU BOTTOM VIEW



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